NAUSET BARRIER EVOLUTION AND ECOSYSTEM ASSESSMENT

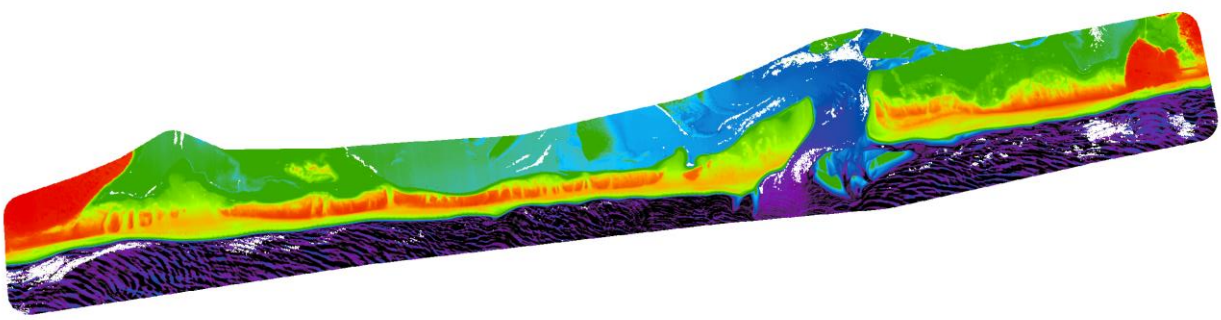
Phase 1: Barrier/Inlet Evolution

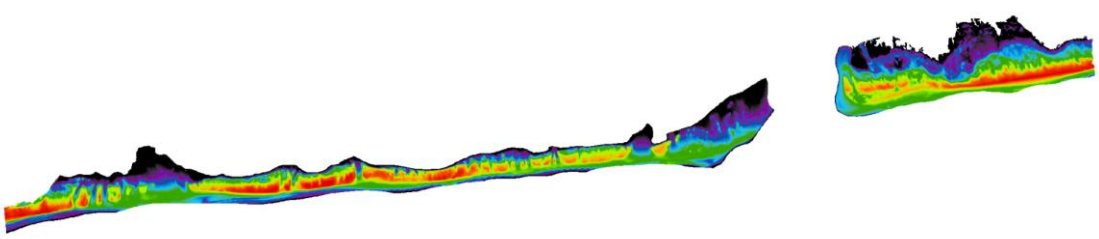
A) 3D Mapping of Barrier via Drone Surveys
B) Short-term Barrier Evolution: Erosion, Overwash, Barrier and Inlet Migration

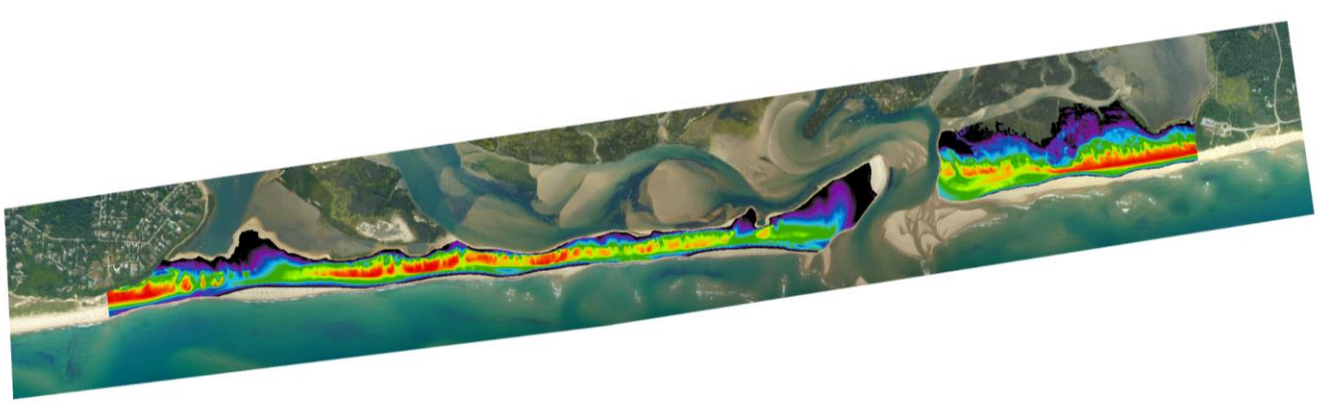
Phase 2: Ecosystem Assessment

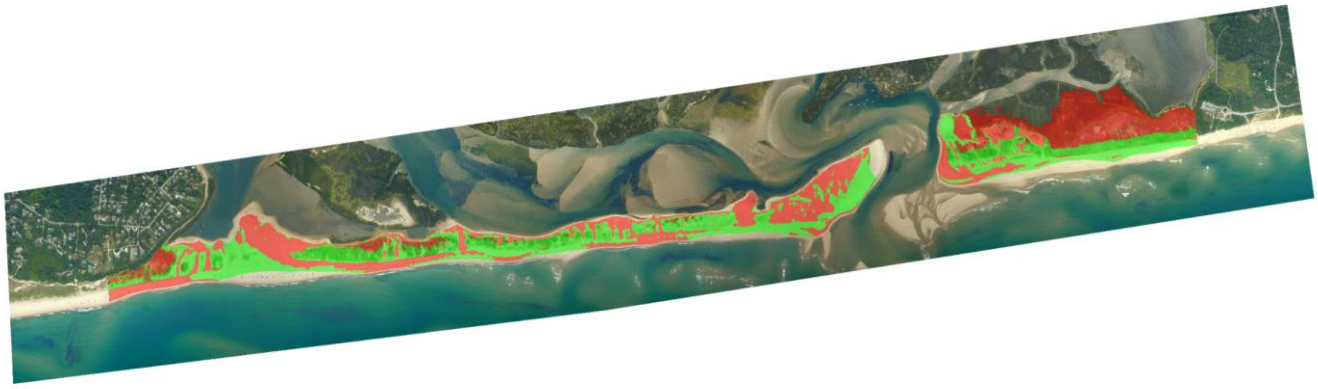
A) Seafloor Habitat Study
B) Finfish Study
C) Future Barrier/Inlet Configurations 2020 – 2070

D) Ecosystem Assessment Report









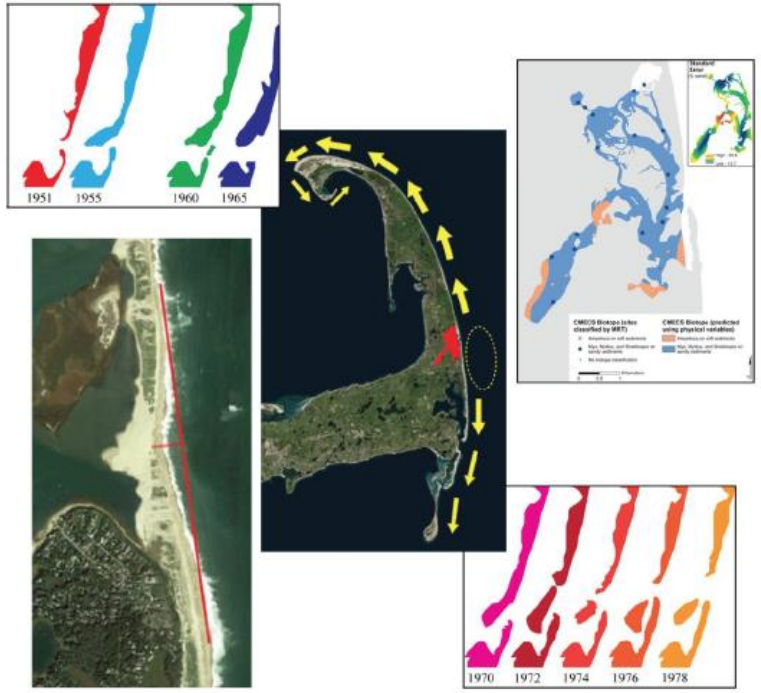
2-Dimensional Analysis

- The Inlet migrated ~200 ft from 2018 – 2021
- The Northern Barrier got shorter, the Southern Barrier got longer.
- Documented areas of deposition and erosion

Center for Coastal Studies Provincetown
Hiebert Marine Laboratory
5 Holway Avenue
Provincetown, MA 02657
tel (508) 487-3623 fax (508) 487-4695

Potential Impacts to the Nauset Barrier from the Proposed Dredging and Disposal in Nauset Harbo

A Technical Report prepared for the Town of Eastham, Massachusetts



April 2019
Report prepared by the Coastal Processes and Ecosystems Laboratory
at the Center for Coastal Studies
Publication: 19-CL07

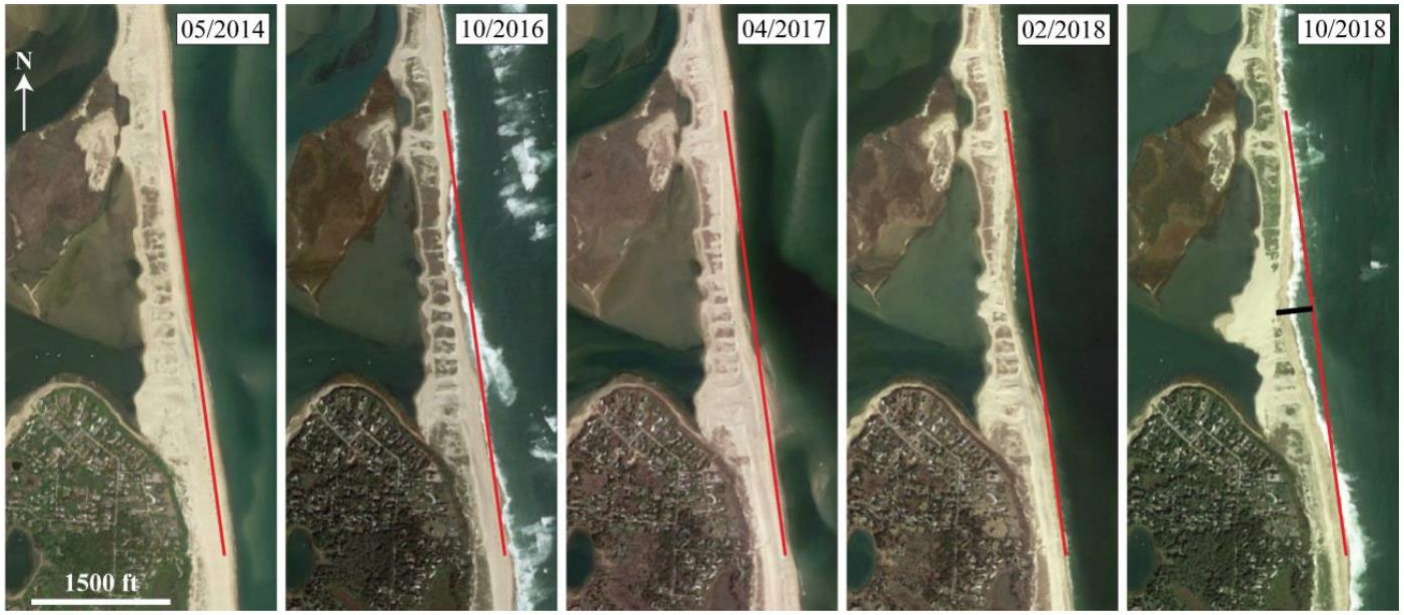
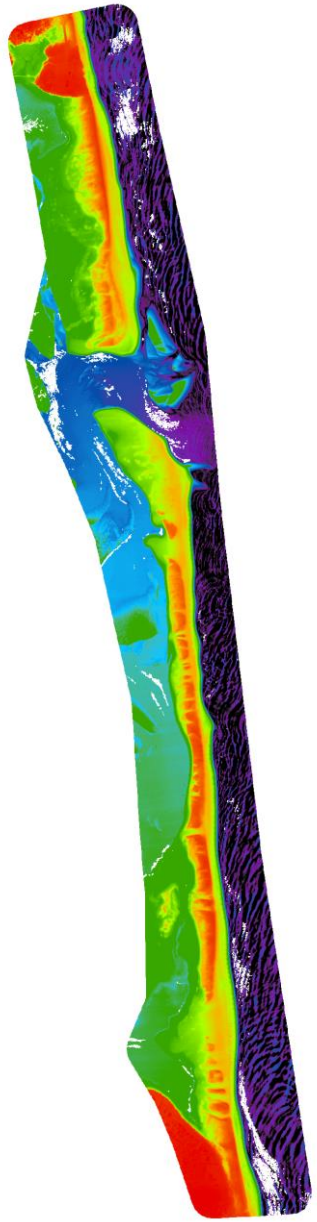


Figure 3. Shoreline change north of Nauset Heights. The red line is in the same geographic location for each photo. The shoreline has moved more than 400 ft landward in some places from 2015 through 2018, or >140 ft/yr. The black line in 10/2018 photo shows area of greatest change. All photographs taken from Google Earth.

Figure 3. Shoreline change north of Naus same geographic location for each photo. The shoreline has moved more than 400 ft 15 through 2018, or >140 ft/yr. The black line in 10/2018 photo shows area of greate from Google Earth.

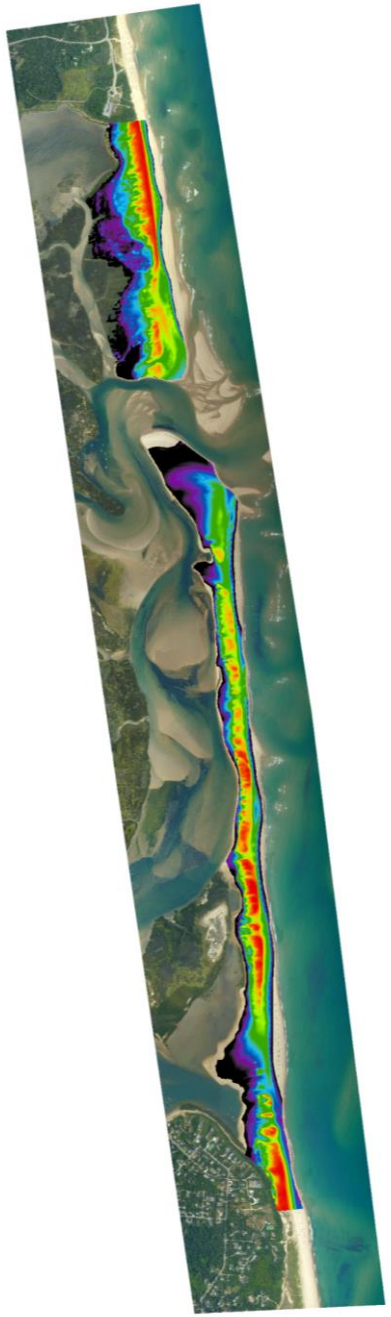
2018

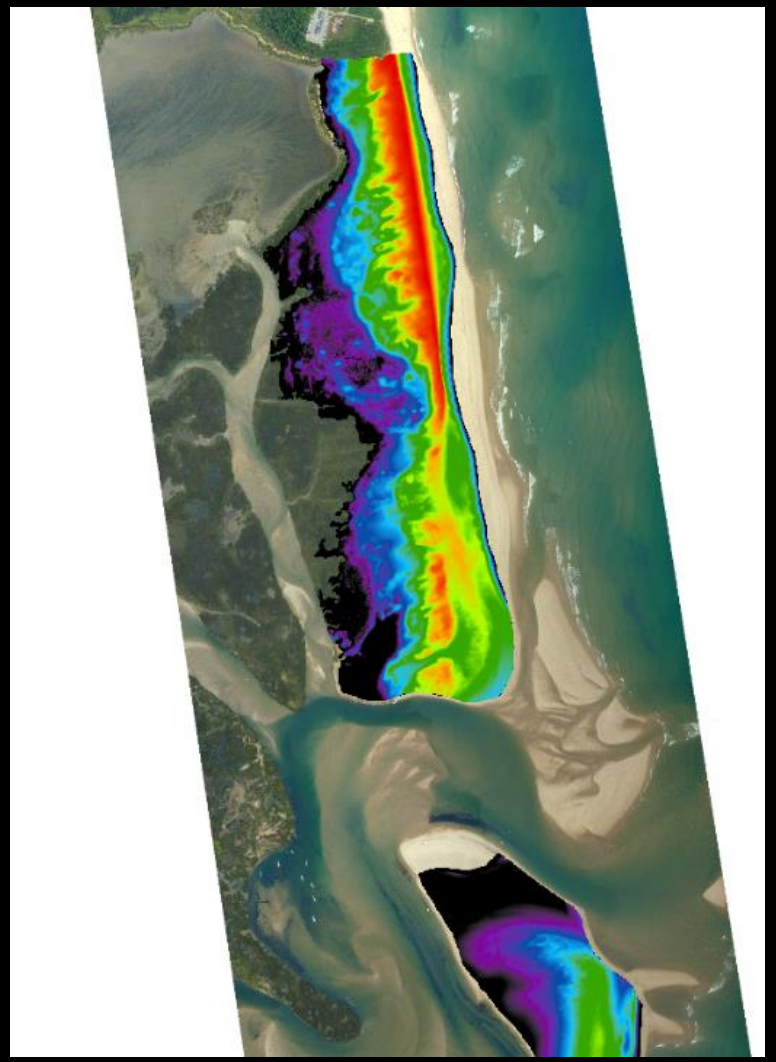
2021



3-Dimensional Analysis

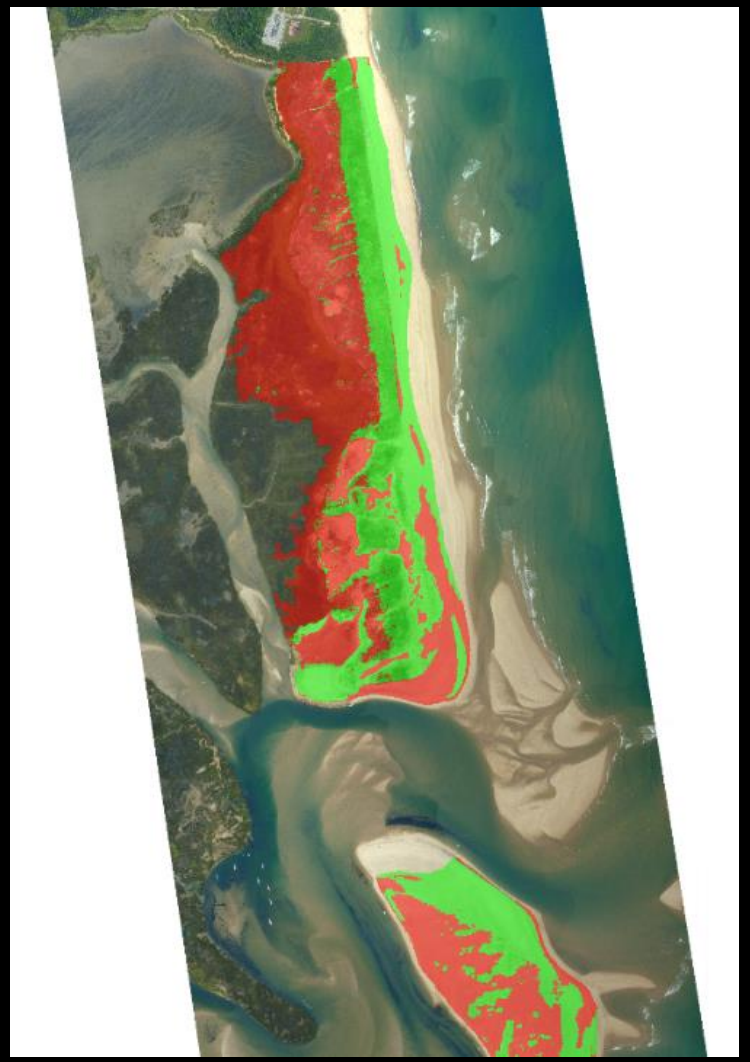
- Barrier volume overall stayed the same: Gained about 5%
- The Northern Barrier lost ~5% of its volume
- The Southern Barrier gained about 10% of its volume

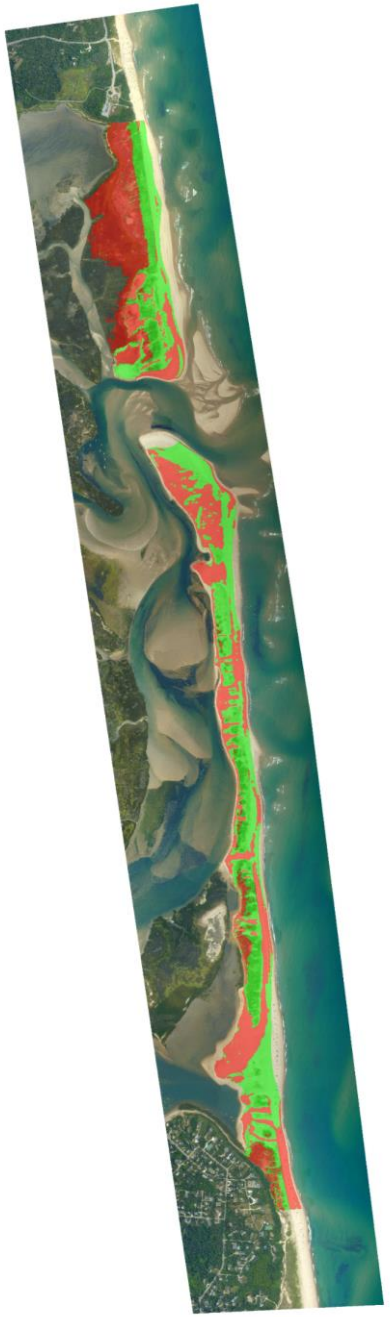


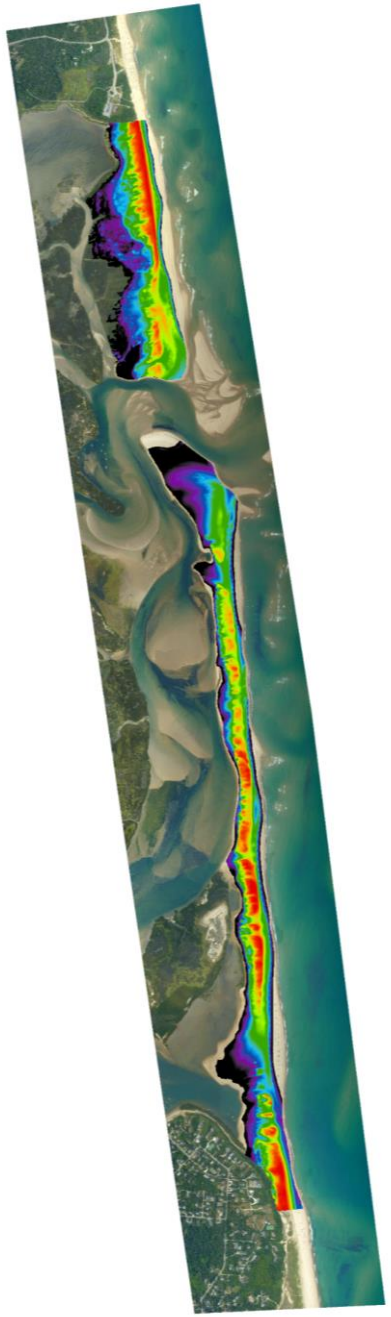


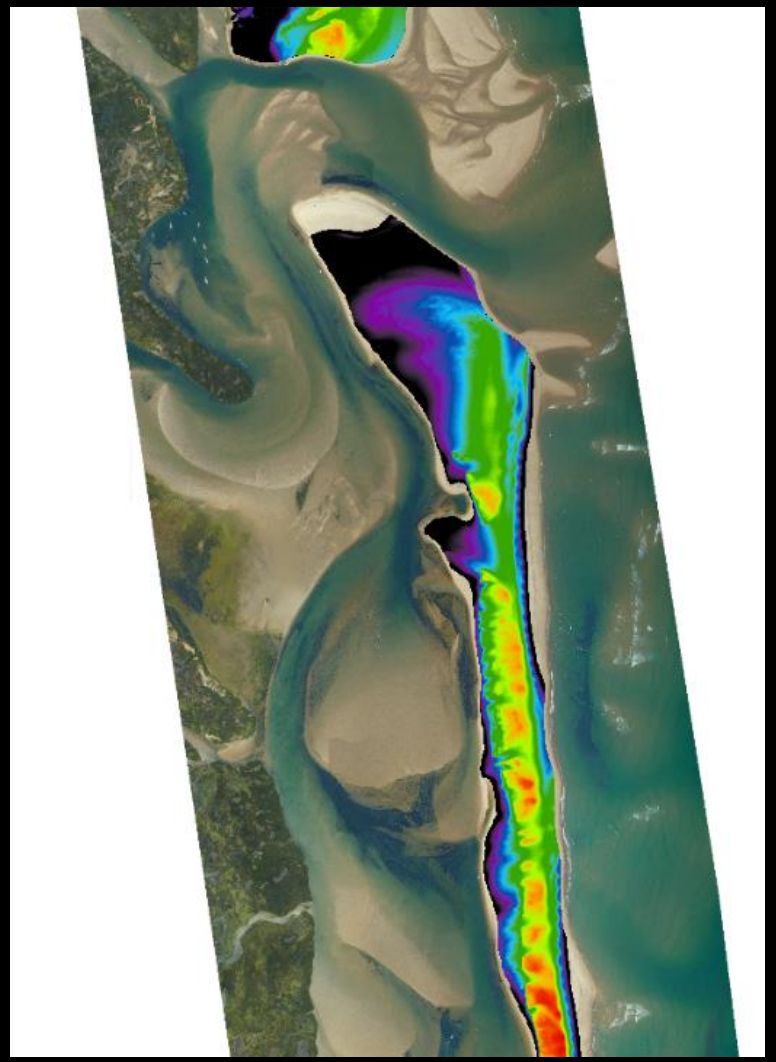
Deposition

Erosion



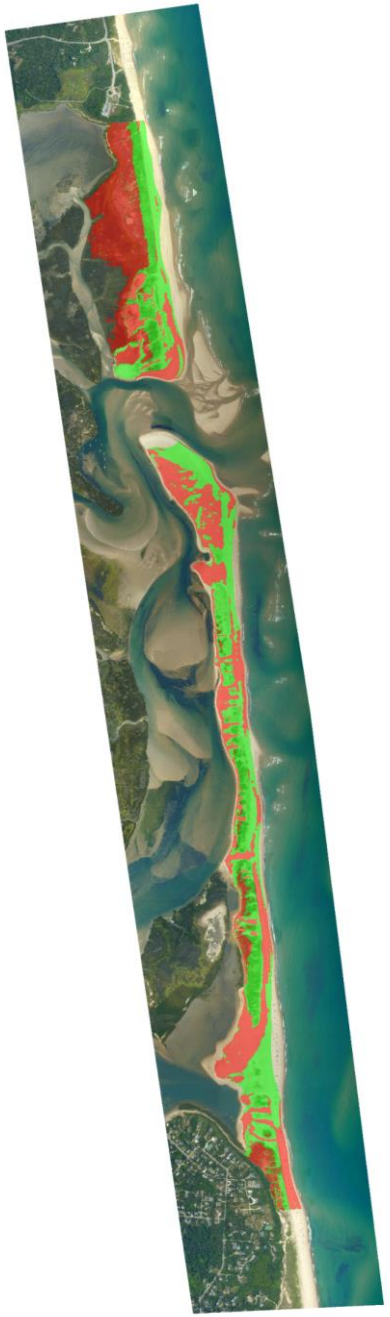


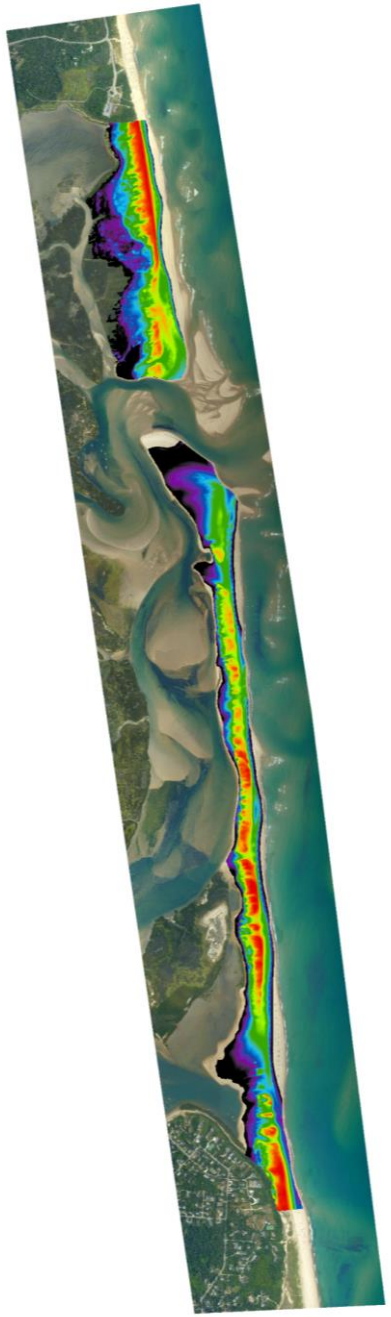




Deposition

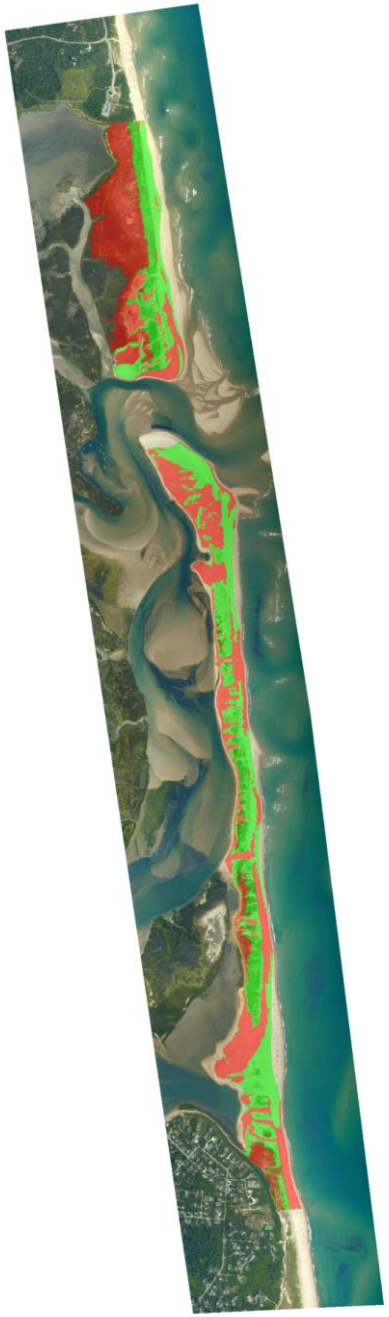
Erosion





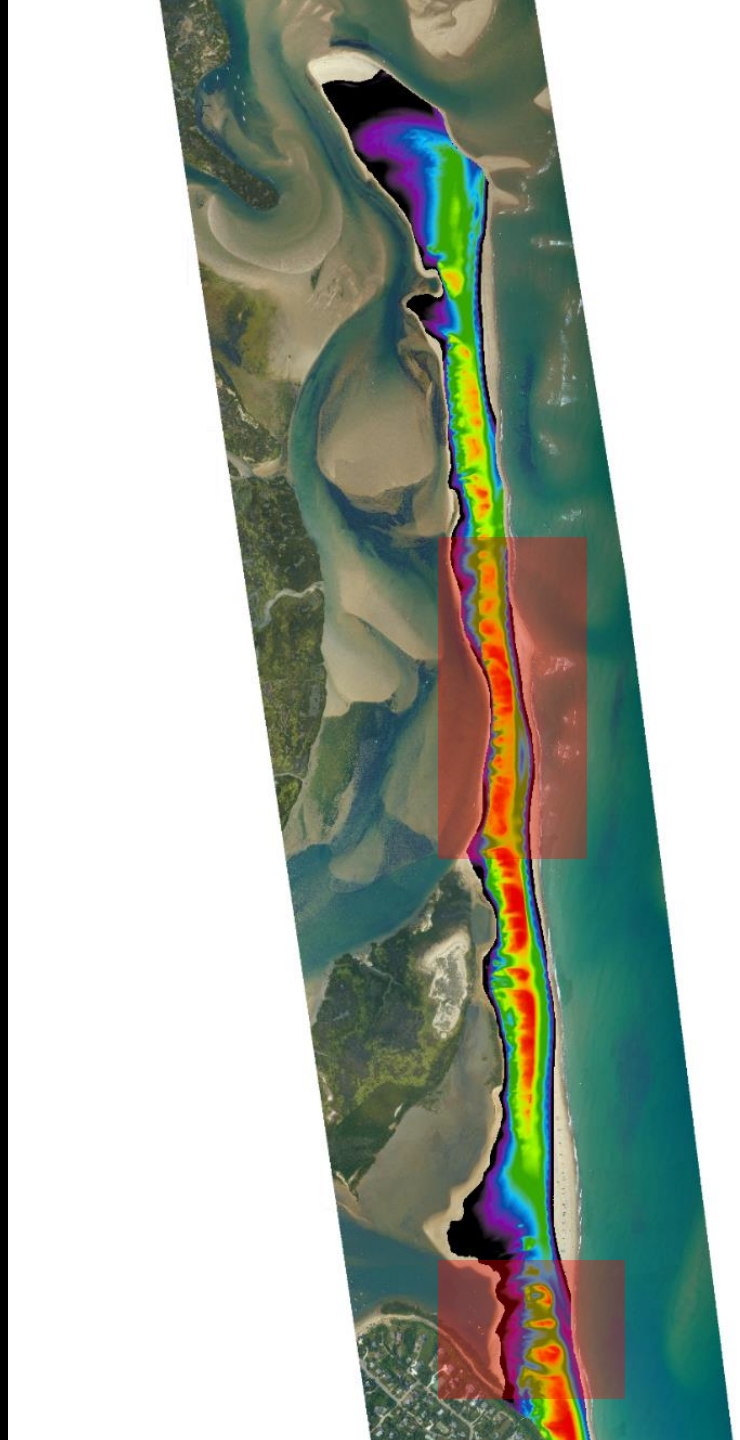
Deposition

Erosion



Future Barrier/Inlet Configurations
2020 – 2070

- Ingredients needed for Future Inlet Formation
  - Narrow, low-lying barrier
  - Basin behind barrier for water to flow in and out of
  - Event…
  - Water flowing out during low tide



Seafloor Habitat Study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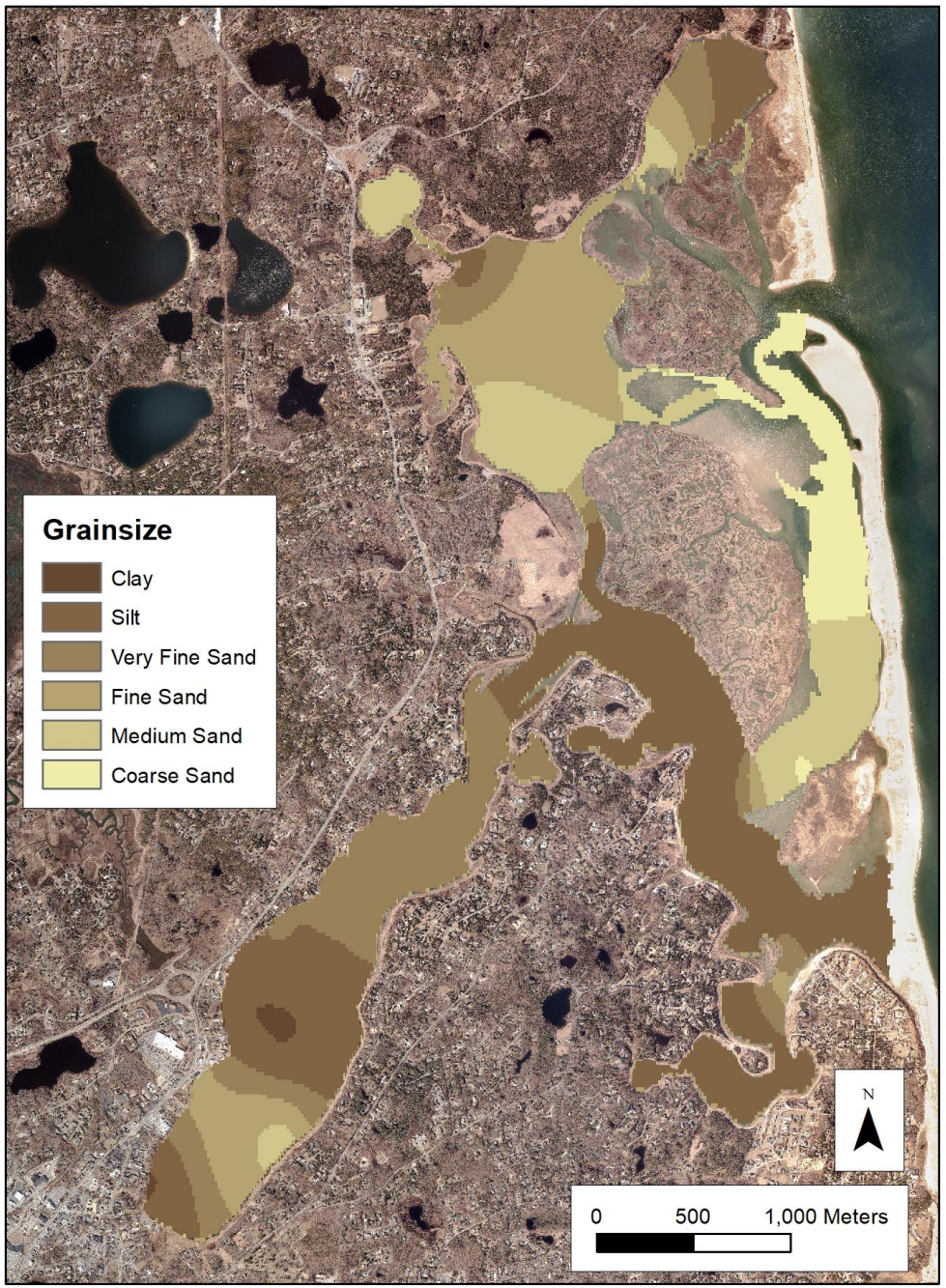
Source: Esri, Maxar, GeoEye, Earthstar Geographics, C
and the GIS User Community

2014

2020

CMECS Substrate Component

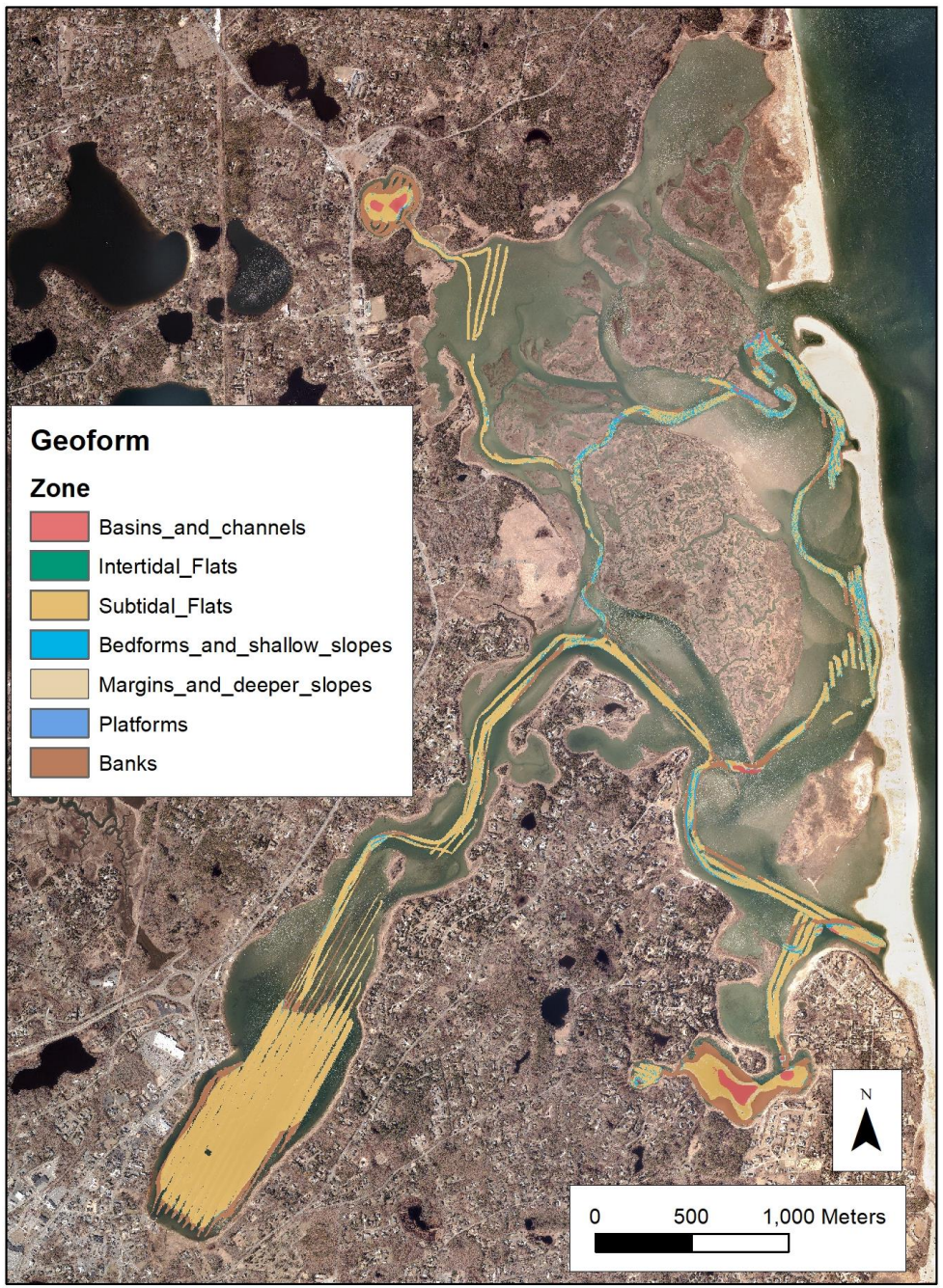
Grain size analysis of 25 samples



2014

2020

CMECS Geoform Component



2014

2020

CMECS Biotic Component

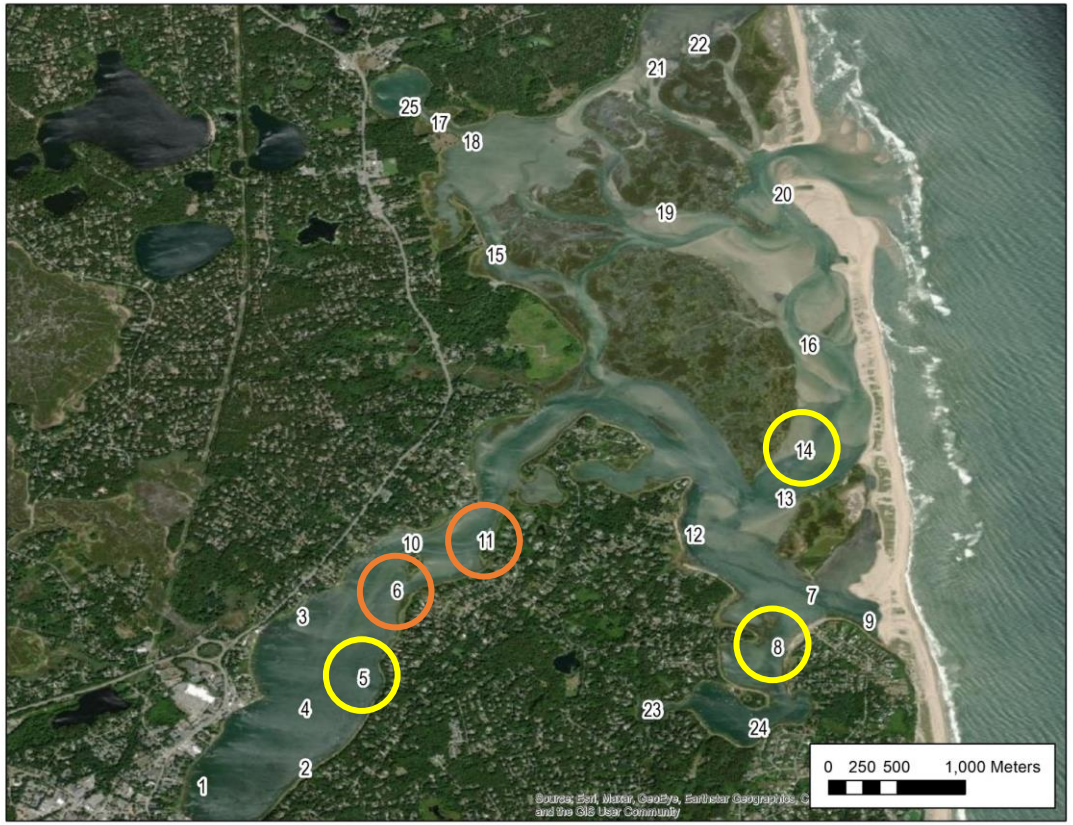
Benthic invertebrate samples from 25 stations

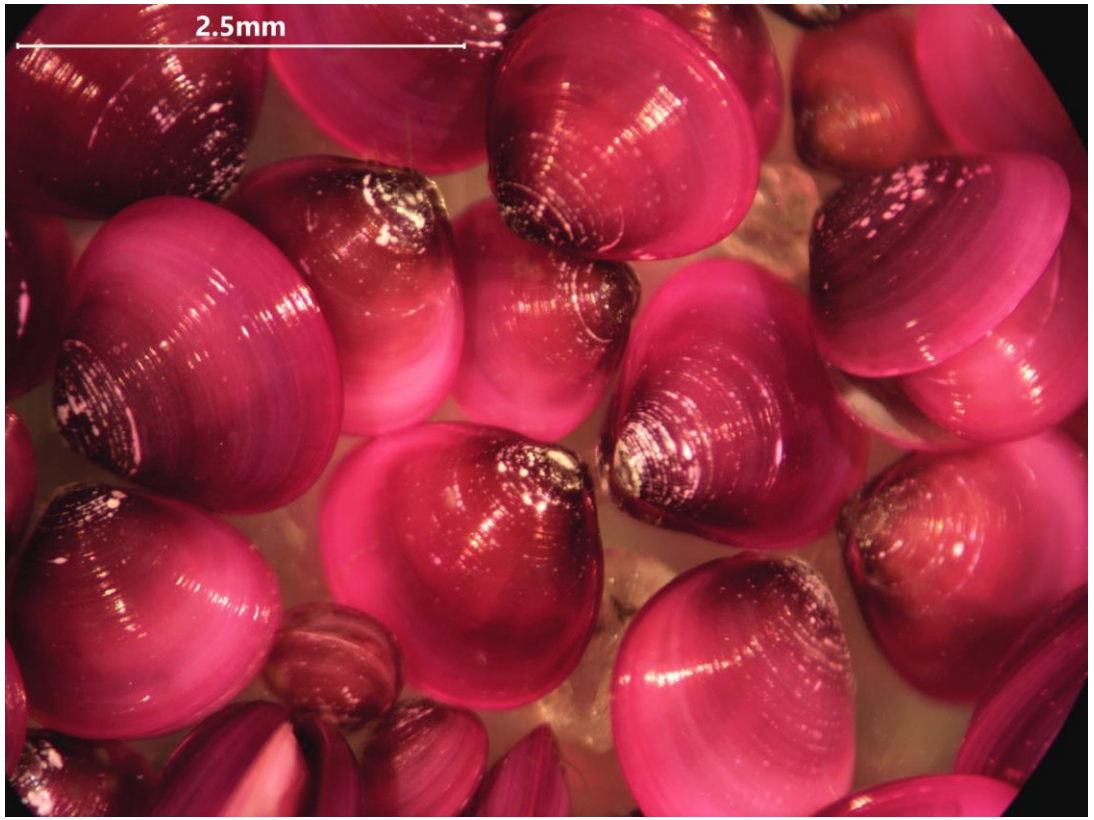
	2014
Diversity	75
Abundance	38,242
Most abundant species	Corophium
Most diverse station	Station 6
Most abundant station	Station 11

CMECS Biotic Component

	2014	2020
Diversity	75	78
Abundance	38,242	10,427
Most abundant species	Corophium	*Gemma gemma*
Most diverse station	Station 6	Stations 5 and 8
Most abundant station	Station 11	Station 14

CMECS Biotic Component





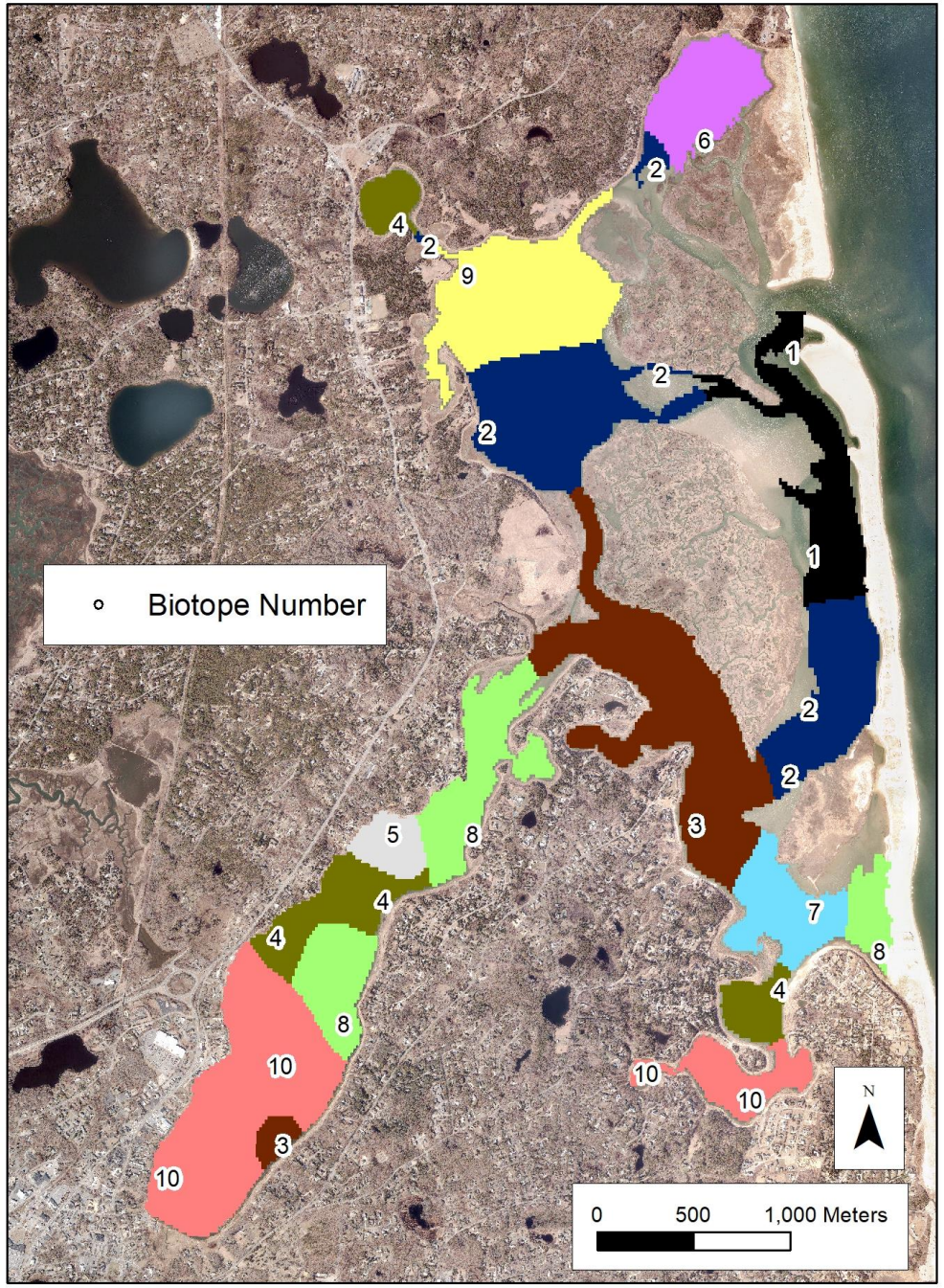
2014

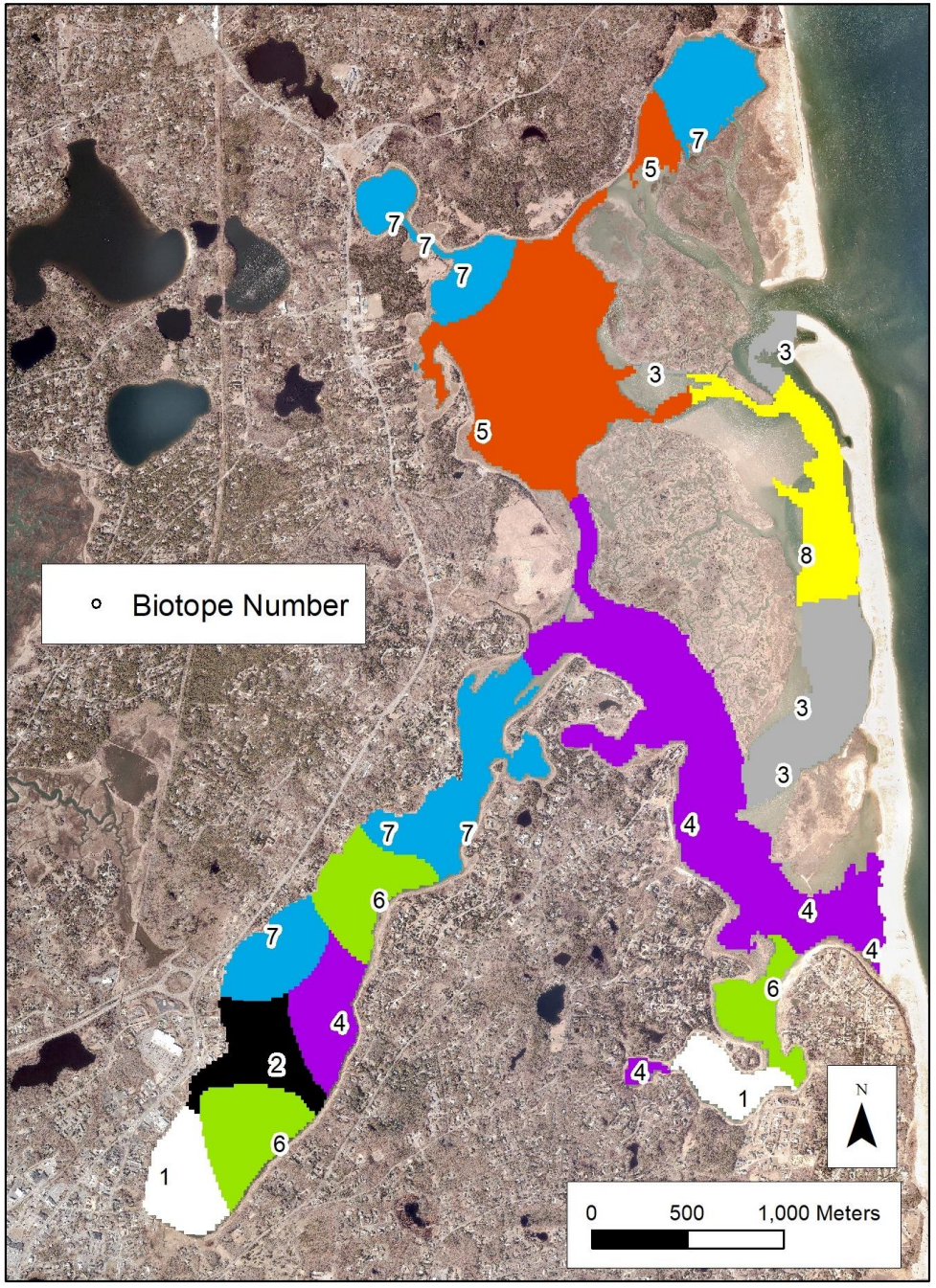
Preliminary 2020

CMECS Biotopes

Are calculated based on grain size, geoforms and biological data.

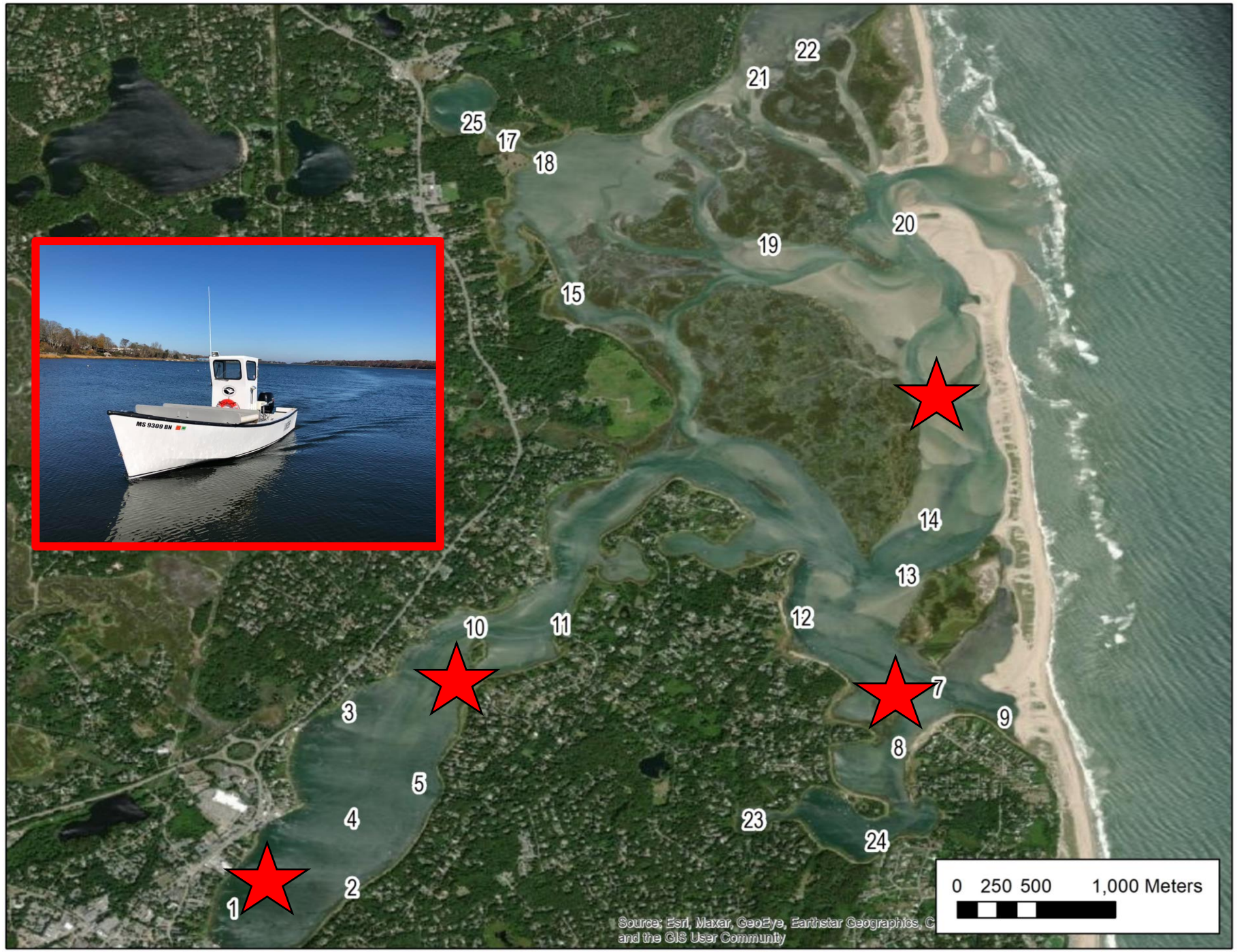
This year we added video data – results coming soon





Featherduster worms, bristle worms and Amphipods

Finfish Study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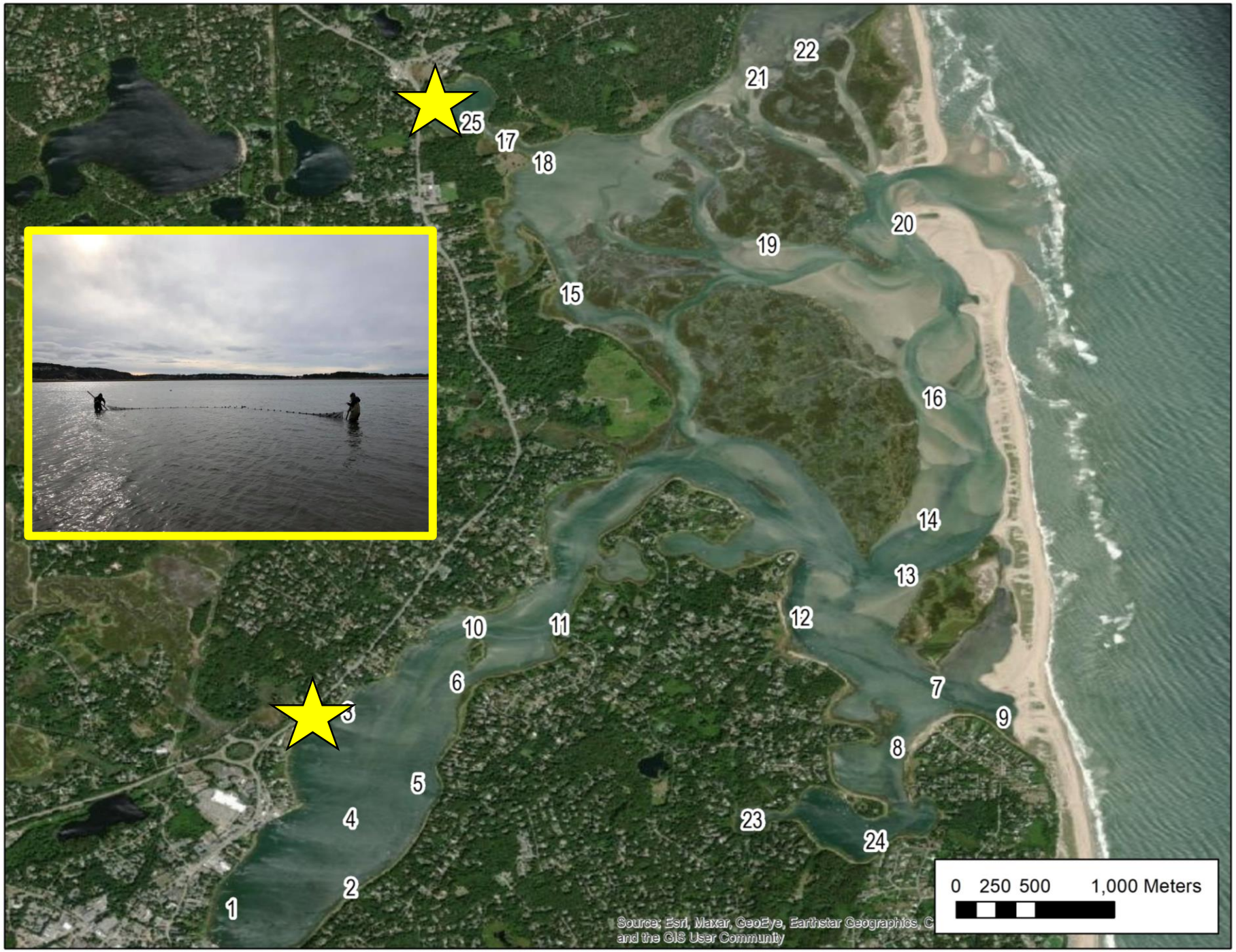
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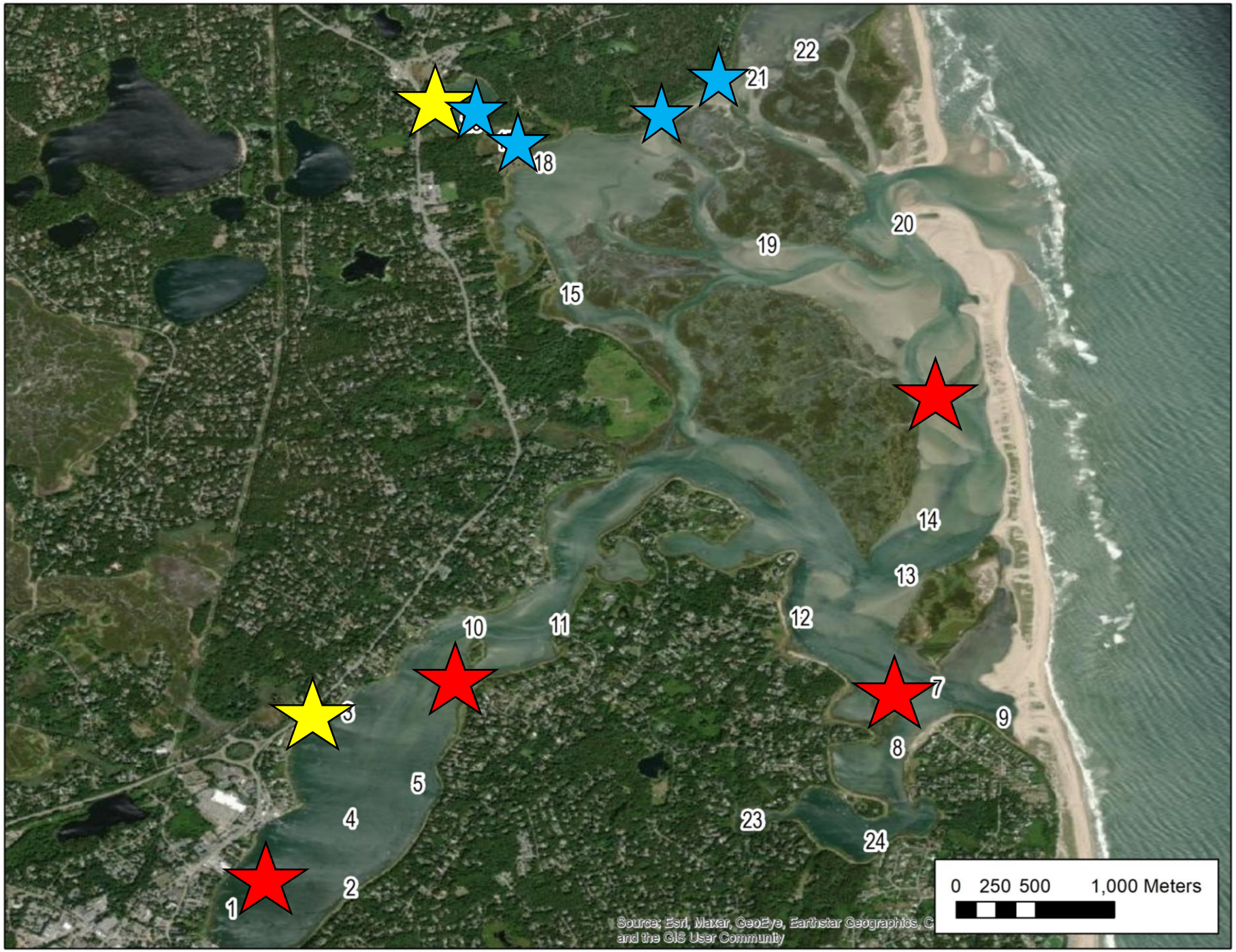
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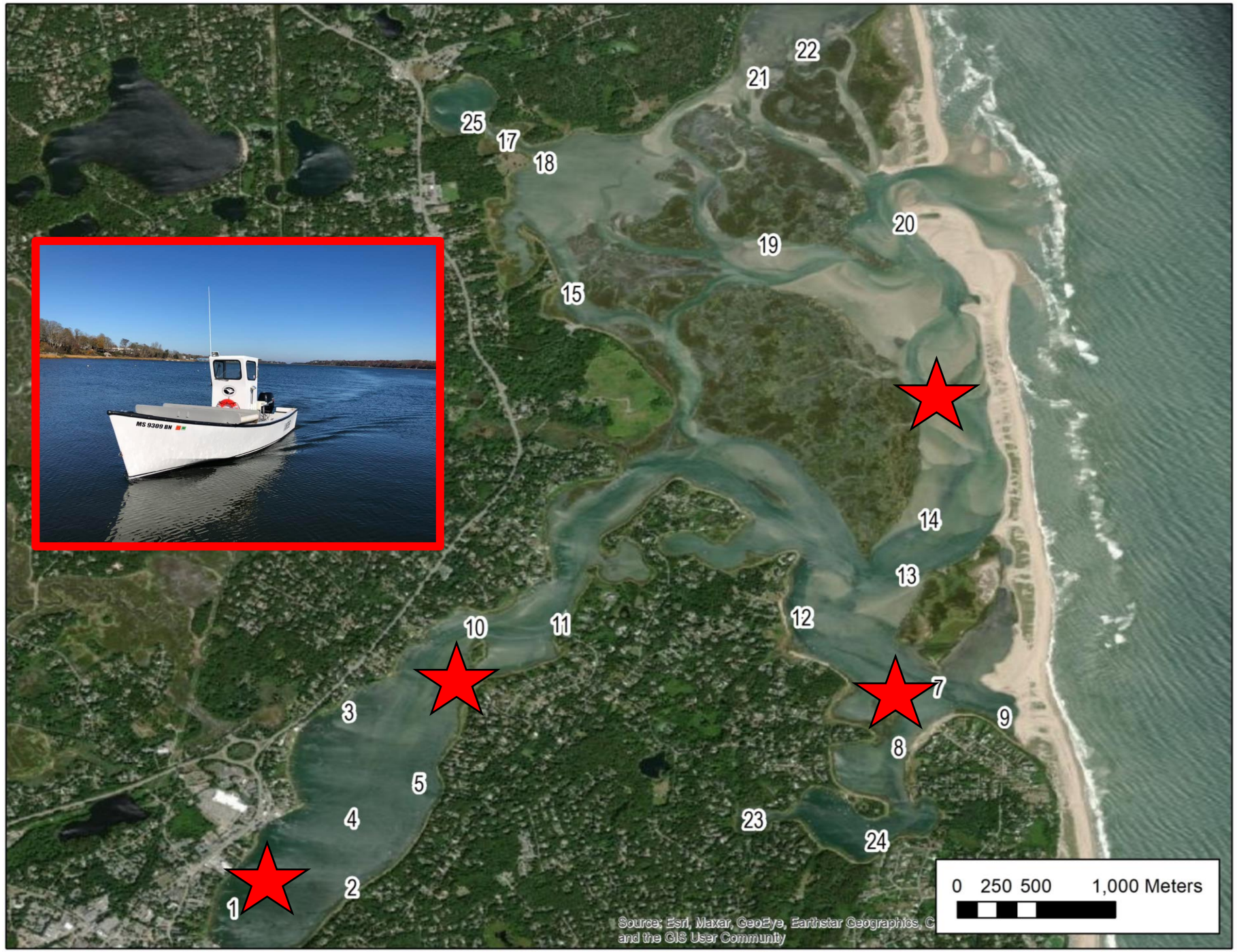
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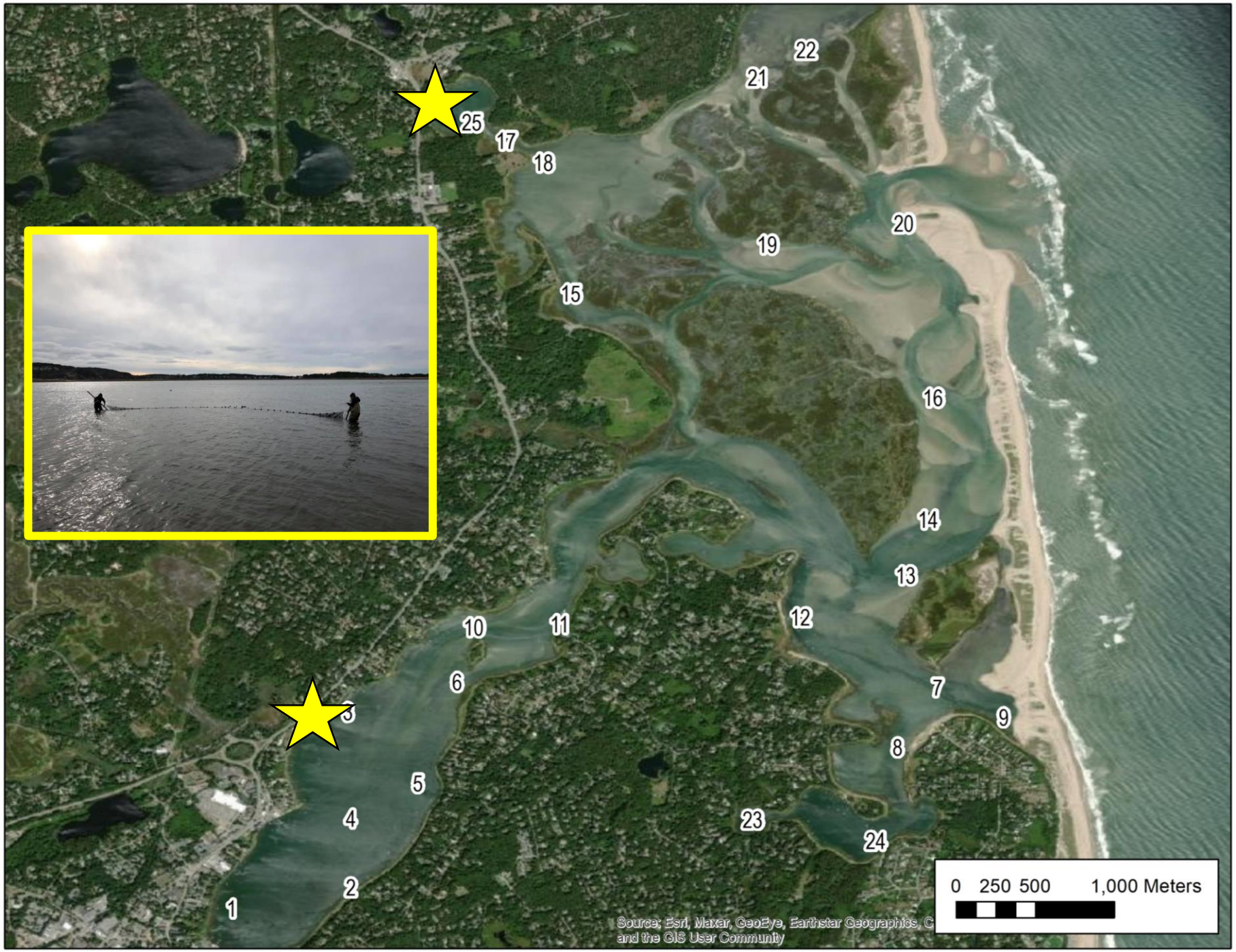
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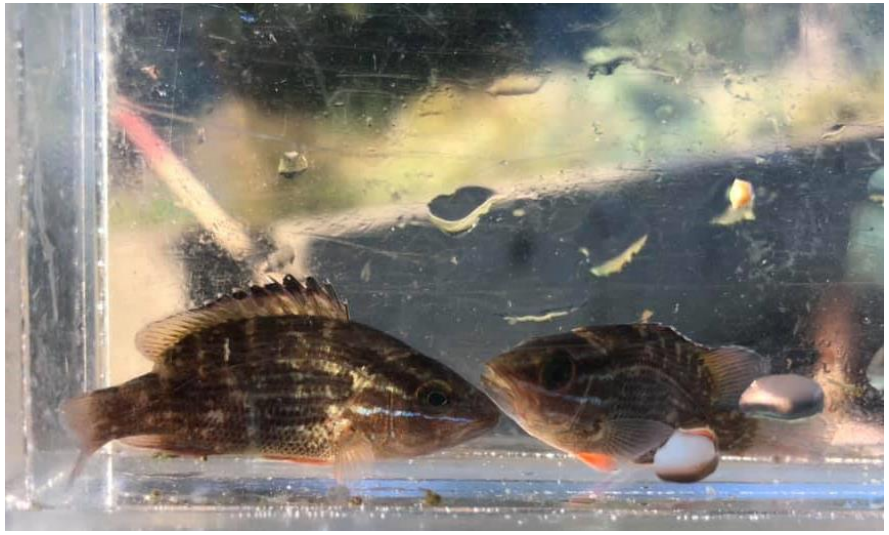


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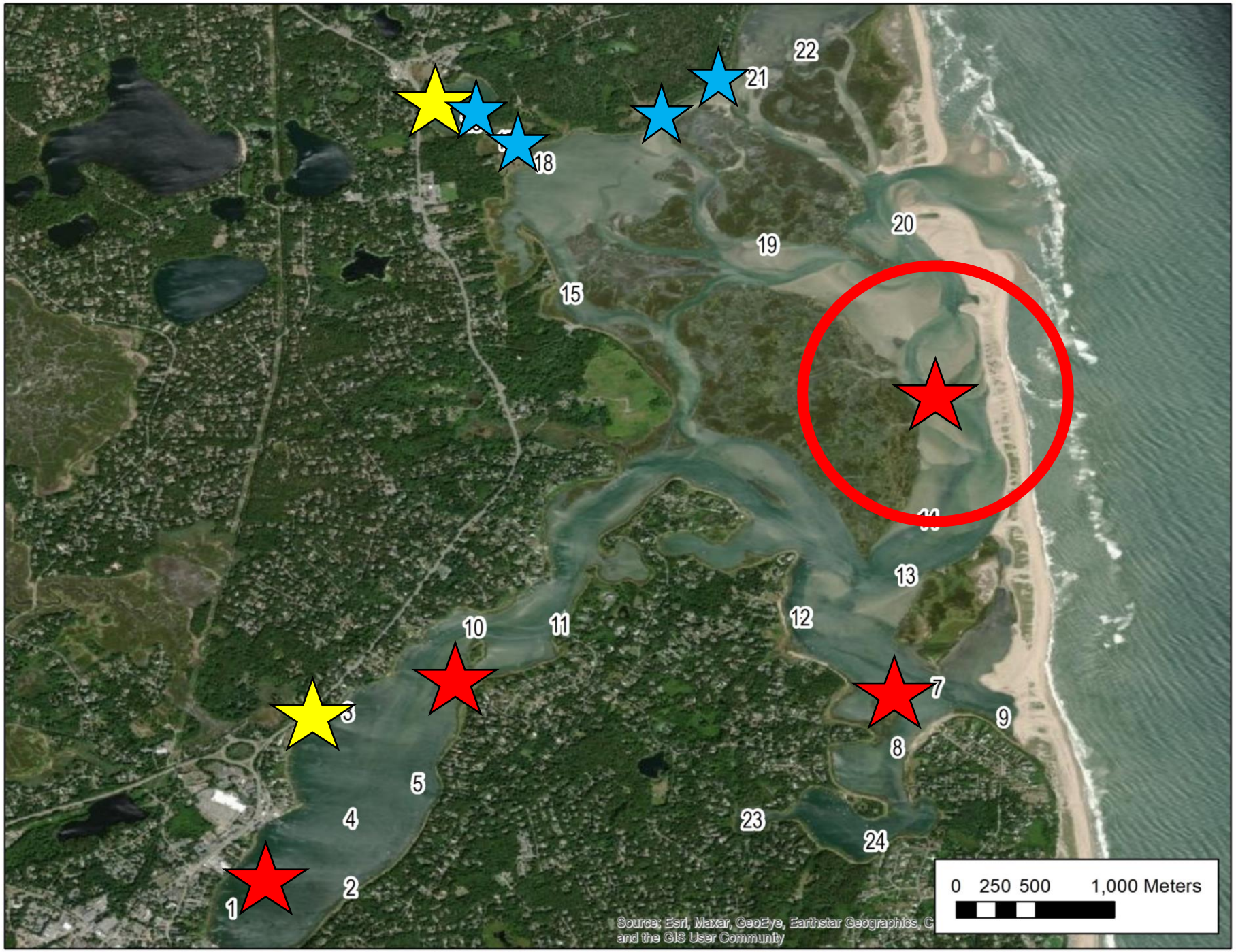
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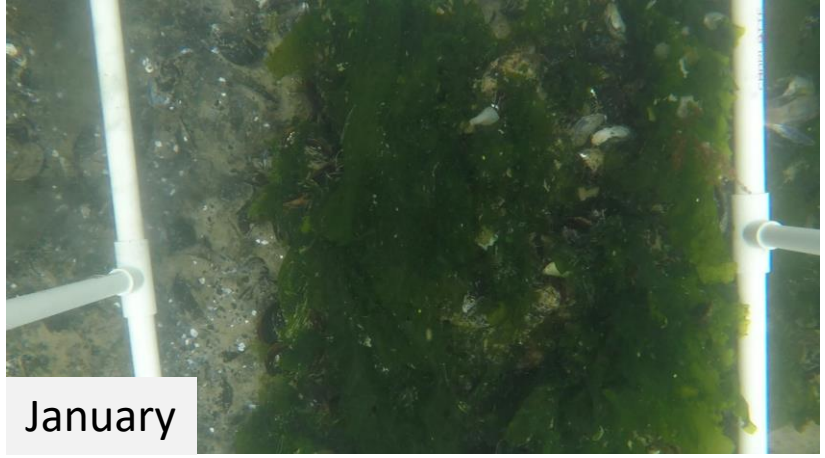
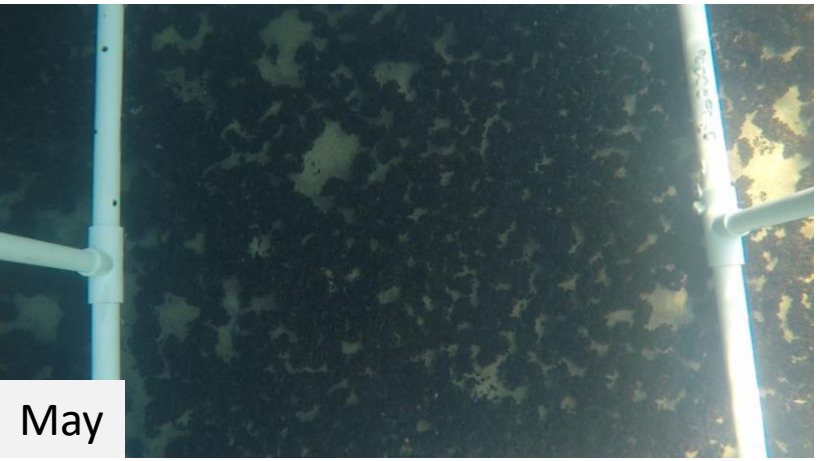
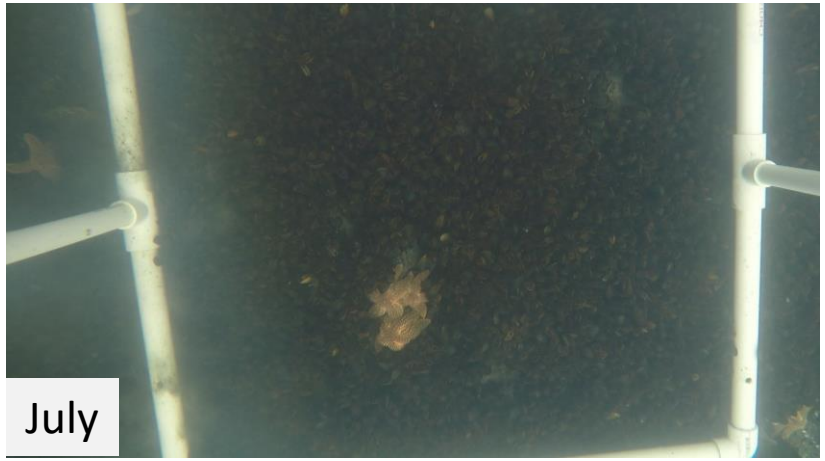
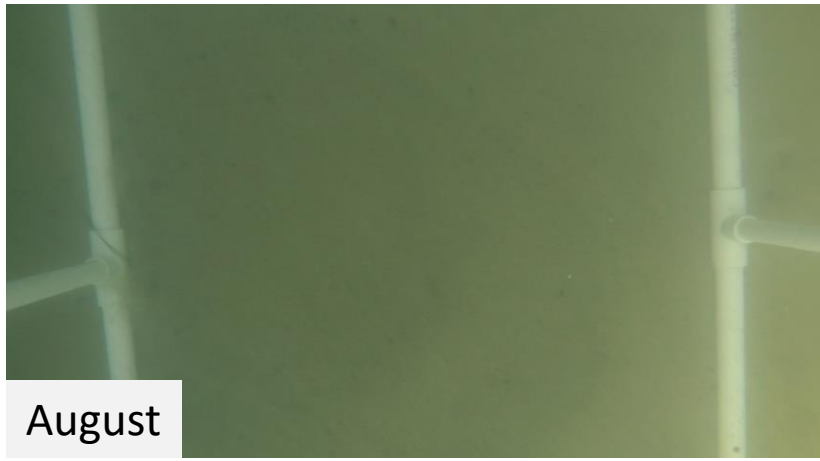
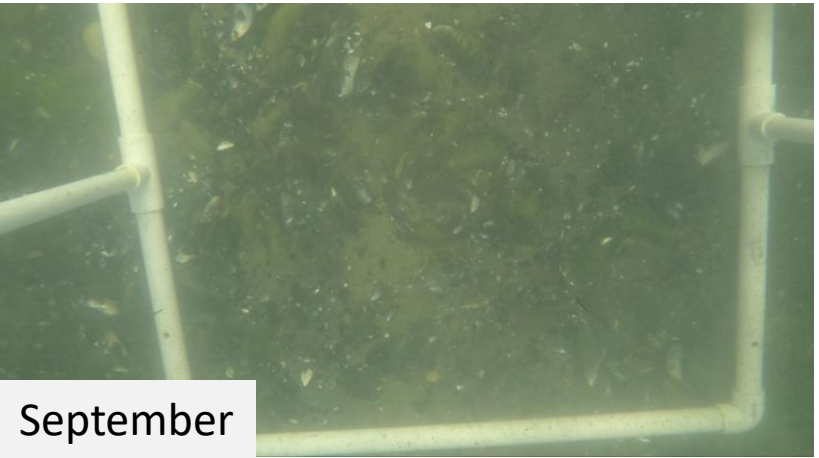
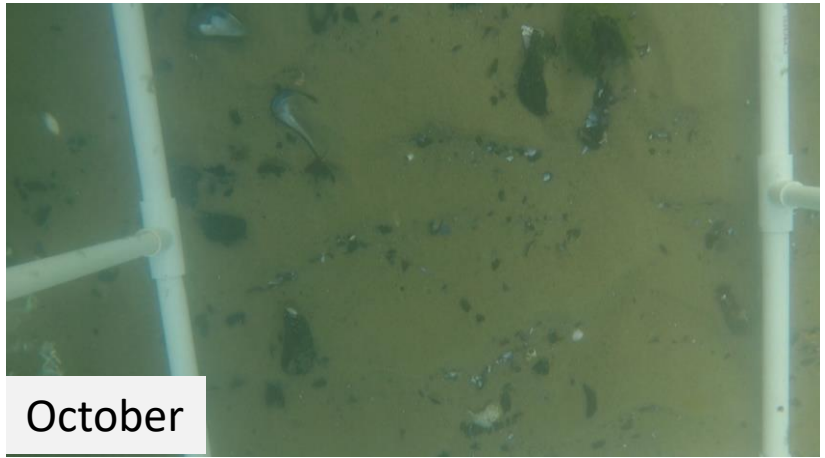




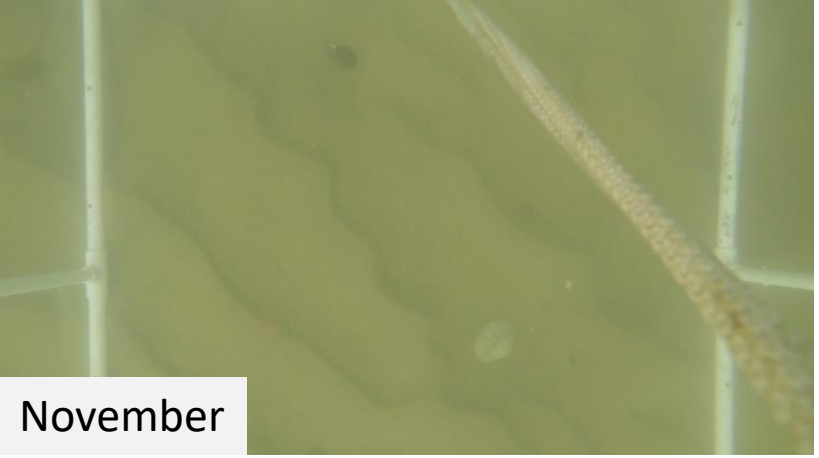








Station 16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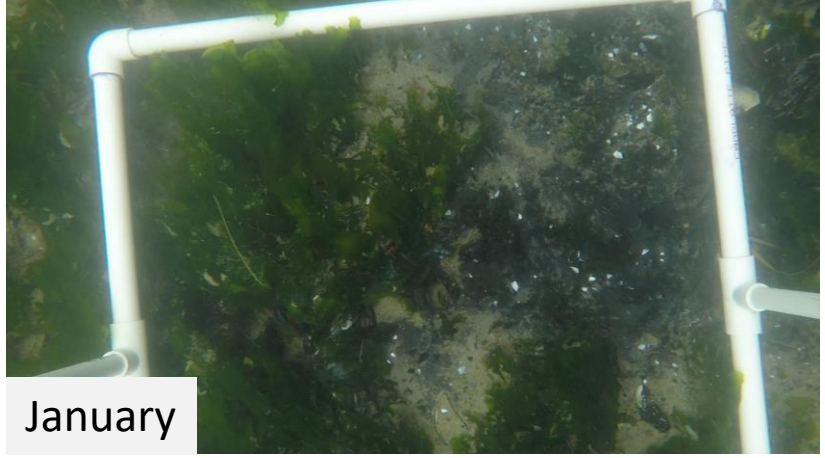
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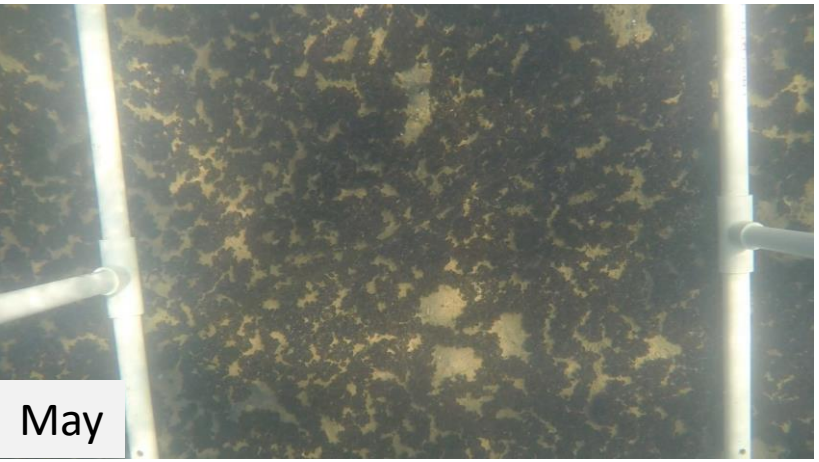
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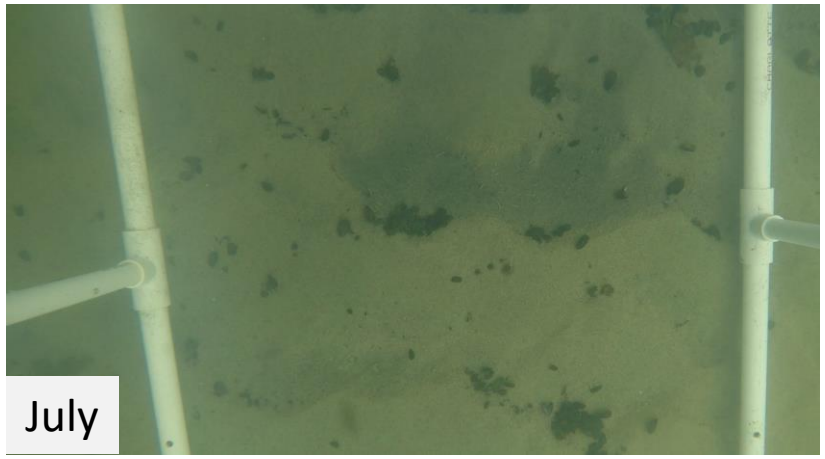
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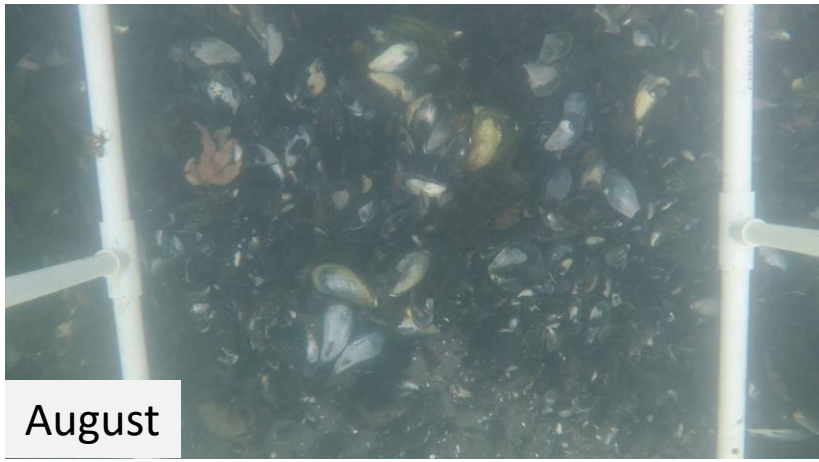
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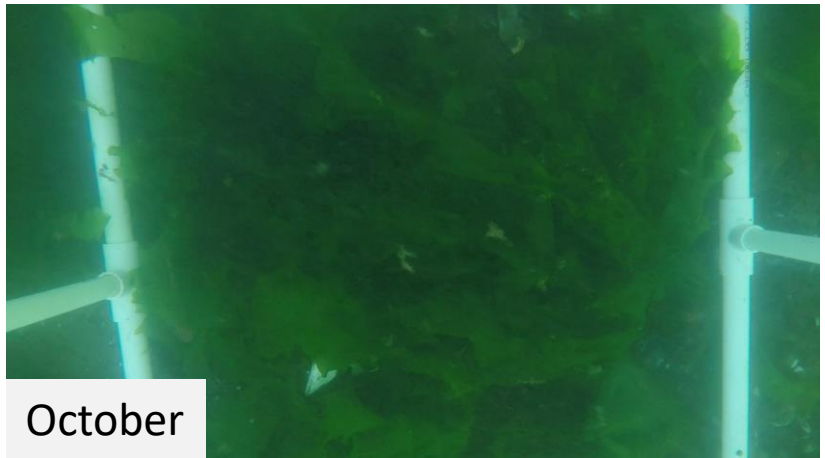
October

Station 16


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